INTRODUCTION

Business geographic information systems (GIS) provide powerful tools for managers wishing to use spatial tools to understand their organizations and operations more completely. The emergence of integrated business GIS solutions (IBGIS) enables enterprises of all sizes to exploit spatial analysis in more effective decision making. Enterprises that exploit this resource gain competitive advantage through a better understanding of their competitive environments, markets, customers, operating processes, and growth opportunities.

This overriding reality above marks an evolution in the development of GIS technologies in the business world. Once the province of a relatively small group of specialists skilled in the minutiae of arcane software running on powerful, graphics-intensive computer systems, GIS has emerged as an enabling technology for analysts, researchers, managers, and problem solvers in a variety of disciplines. In the business world, this has meant broader dissemination of GIS tools, the development of specialized analytical models and procedures for business problems, and the design of interfaces for managerial users with relatively little formal GIS training. Indeed, the merging of these trends into powerful integrated business GIS solutions provides the focal point for this book.

In the broadest sense, geographic information systems are families of information technology tools that support spatial inquiry and reasoning. That is, they enable users to pose, research, and analyze spatial questions as well as to communicate spatially relevant information in decision-making processes. GIS systems include computer hardware and software components, data aggregation and integration capabilities, professionals with specialized skills in spatial analysis, and information clients (managers and executives in the business GIS framework) with problems to be solved and decisions to be made.

Once confined to the desktops of specialists, GIS resources are now ubiquitous across the information technology landscape. GIS capabilities have been extended to Web-based applications, integrated into commercial and enterprise systems, packaged as server applications for internal and external organizational clients, and offered as spatial building blocks—or objects—for developers to use in designing enterprise solutions.

All this is in the organizational information technology (IT) world. In the broader world, consumer-oriented mapping systems such as ArcGIS Explorer, MapQuest, Google Maps, Google Earth, and Microsoft Bing Maps have educated millions of users in the richness of spatial and spatially organized information. More importantly, these systems have familiarized users with the procedures for using map-based interfaces to organize and explore information. They then are able to navigate map-based interfaces more competently when they encounter them at work or on organizational Web sites.

GIS tools are used in a wide range of environments, organizations, and applications. When applied to business decision making, they are known as business GIS. The general benefits of GIS resources in business decision making are well established. GIS systems enable business professionals to view the geographic dimension of business data directly, to understand it more fully, to perceive relationships with other spatial information more effectively, to resolve spatial problems in business operations more comprehensively, and to communicate the rationale for those decisions more clearly. [1]

Despite this rich potential, businesses have been relatively slow to adopt GIS technologies. The constraints to more rapid adoption include:

- Hardware and software acquisition and maintenance costs
- Data acquisition and management costs
- Human resource costs to acquire and maintain GIS skills
- Limited awareness of GIS capabilities among information technology professionals [2]

The emergence of integrated business GIS solutions has allowed organizations of all sizes to exploit the capabilities of business GIS while overcoming many of these constraints. These solutions are built on standard GIS platforms with four very significant enhancements. The first enhancement is the bundling of extensive commercial data from a variety of sources into integrated systems. This streamlines data acquisition, lowers overall data costs, and addresses the issue of maintaining current data for business GIS analysis.

The second enhancement is the ability to interface with organizational IT systems to integrate enterprise data into business GIS systems, join it with bundled commercial data, and analyze it to reveal spatial patterns relevant to business decisions. This capability of creating new insights into organizational data through spatial analysis is a key benefit of business GIS.

Many of those insights come from the third enhancement of integrated business GIS solutions: a rich collection of automated tools, wizards, and procedures to perform advanced spatial analysis. By automating these procedures, organizing them logically, and presenting them to users in familiar, wizard-based interfaces, these solutions place powerful analytical tools at the disposal of users with relatively little GIS training. This allows greater access to these tools by managers and supports more extensive use of spatial insight in business decision making.

The fourth enhancement consists of a wide variety of standardized reports, maps, and graphs that communicate the results of GIS analyses. These documents capture relevant information efficiently and present it clearly to enable more effective communication of spatial analysis. In this way, they provide strong support for recommendations resulting from that analysis. In many IBGIS implementations, the formats for these documents are customizable, allowing users to produce exactly the type of reports and maps that best address the business issue under review.

Clearly, integrated business GIS solutions place significant GIS horsepower at the disposal of managers making business decisions. Though ripe with potential, these enhanced capabilities also pose challenges. To use them wisely, business managers must be familiar with the data bundled with the systems, the streamlined GIS tools available to them, the appropriate use of those tools, and the proper understanding of the reports, maps, and charts that they generate. Given the scope and power of these systems, this can be a daunting task. It becomes even more challenging when managers encounter a variety of integrated business GIS solutions options deployed throughout a range of their organizational information technology infrastructure.

This purpose of this book is to help managers meet this challenge. It focuses on one integrated business GIS solution: the suite of Business Analyst products offered by ESRI. To achieve this purpose, we will follow the life cycle of a single hypothetical enterprise from its inception to maturity. At each stage we will use Business Analyst tools to inform key business analysis and decision making. At each stage, we also will employ the most relevant business GIS tools, apply them to current commercial and organizational data, review the resulting documentation, and use this information in the decision-making process. To begin that process, let's learn a little more about this organization and its owners.

The Living in the Green Lane (LITGL) scenario

Stunned by the heating costs of Minneapolis winters, Janice Brown and her husband, Mark, decided to make the new home they were planning to build as energy efficient as possible. To meet that goal, Janice began an extensive research project on heating, cooling, and insulation options. She quickly learned that other systems in the home such as water, lighting, landscaping, energy, and water-saving appliances offered significant opportunities for increasing efficiency and lowering costs as well. Moreover, as the Browns' concern for environmental quality and the size of their collective "carbon footprint" grew, so did Janice's realization that their efforts at more efficient living likewise could decrease the environmental impact of their lifestyle.

As they built their new home, the Browns experienced difficulty in finding knowledgeable local contractors and builders who could help them implement the technologies they desired. Consequently, they developed relationships with several builders and contractors willing to take on new product lines and add new installation techniques to their portfolio of services. They did so in the belief that the demand for environmentally friendly homes and renovation projects would rise, and with it contracts for their newly developed services.

When the Browns' home was completed, it was featured in several area newspapers in articles that emphasized its distinctive design philosophy and economical operating costs. As a result, several families with similar interests contacted the Browns, as did contractors and builders wishing to emulate their approach. When she realized the growing interest in her research, Janice started to write a monthly newsletter that she sent to subscribers around the country. It highlighted new developments in green building practices and assessed the relative benefits of implementing each approach.

Demand for green building information soon grew beyond the scope of the newsletter format. Users were interested in more technical information as well as references to contractors and builders who could install the systems Janice wrote about. Many readers expressed interest in "green renovations," which improved the environmental quality and lowered operating costs of their existing homes, obviating the need to build new ones.

In response to this trend, Janice transformed her monthly newsletter into LivingInTheGreenLane.com,[3] an informational Web site offering a variety of services to users. These included reviews of emerging environmentally friendly technologies and products that included ratings of their effectiveness. Each week the site described a green building project, highlighting both new construction and renovation. Janice also used the site to answer readers' questions and provide advice on their own green projects. As the site developed, users asked increasingly detailed questions about specific brands of products and the skill, reliability, and expertise of the installers and contractors who worked with these products. Beginning with the contractors who worked on her home, Janice developed an extensive directory of professionals with experience in green products and projects. The directory included architects, designers, and builders, as well as general and specialized contractors.

As her circle of contacts in the green building movement expanded, Janice learned of the Minneapolis-St. Paul Green Builders Guild and its president, Steven Bent.[4] The Guild is a group of professionals in the construction industry whose primary goal is to promote green building practices. To qualify for membership, building professionals must be members of the U.S. Green Building Council,[5] a national organization of green builders, and have completed at least one Leadership in Energy and Environmental Design (LEED) certified house at the Silver level or above. The LEED for Homes certification system for home building assigns points for design and construction elements across eight categories for new homes, with certification levels at the Certified, Silver, Gold, and Platinum levels.[6] Guild members wish to promote green construction in the Minneapolis-St. Paul area but are constrained by the lack of a central location to demonstrate green building techniques and their benefits.

As Janice learned more about the Guild, she envisioned opportunities for expanding LivingInTheGreenLane.com in collaboration with the Guild and its members. She met with Steve to discuss the concept of expanding the LITGL concept to an actual retail store. The store would carry building materials, products, tools, and appliances consistent with LEED for Homes certification standards and procedures. In addition, it would include several booths and small workshop areas to support instructional activities. In these spaces Guild members would offer seminars, training, and information-sharing sessions to consumers interested in learning about green building and its potential. In one Living in the Green

Lane Home Center, customers could learn about green building approaches such as house design, renewable building materials, water-efficient plumbing systems, and energy-efficient heating and cooling systems, as well as proper siting and landscaping practices to limit external water use. Local Guild members in each of these fields would offer education, training, and maintenance services to help home customers integrate the full range of green resources into environmentally friendly, efficient home projects.

Janice and Steven believe that this set of goals requires a free-standing retail facility of 40,000 to 60,000 square feet. The facility must have substantial parking and space for outdoor demonstrations as well as shipping and inventory management capabilities. They prefer to acquire an existing building rather than construct a new one. This is consistent with LITGL's philosophy of improving the environmental performance of existing facilities whenever possible. It also provides the opportunity to demonstrate the value of green building practices by renovating a substantial existing facility to reduce its environmental footprint. Finding such a facility in the Minneapolis-St. Paul area that will meet these criteria, while providing a convenient shopping opportunity for green-conscious consumers, will be one of the critical "make or break" factors in their new enterprise.

Business GIS in a "born spatial enterprise"

To secure financing, Janice and Steven must convince banks and potential investors of the viability and profitability of their business model. To do so, they must write a business plan that provides a comprehensive description of this model, the customer base to which it will appeal, and the competitive environment in which it will operate. If their enterprise is successful, they must manage its growth, identify expansion opportunities, and extend its customer base. Each of these challenges has a significant spatial dimension. Understanding that dimension and using it to exploit opportunities more fully, serve customers more effectively, and communicate with investors more clearly will be key components of LITGL's success. Thus, Living in the Green Lane exemplifies the "born spatial enterprise," an organization which embraces business GIS as an integral part of its business processes from its inception.

The vehicle for this evolution is ESRI Business Analyst, a suite of products from the world's leading supplier of geographic information system (GIS) software. Business Analyst is an extension of the ArcGIS family of technologies. It integrates these technologies with extensive data collections, sophisticated wizard-based analytical tools, powerful reporting capability, and robust mapping tools. In short, Business Analyst is an integrated business GIS system that makes rich data and powerful analytic tools available to users with relatively modest GIS skills.

Business Analyst is available to users in several different formats. ESRI Business Analyst Online (BAO) is the Web-based version of the software which serves, as it will for LITGL, as an excellent point of entry into the business GIS world. ESRI Business Analyst Desktop (BA) extends its capabilities even further with extensive tools for trade-area analysis, site selection, customer profiling, site prospecting, sales territory design, and delivery/service routing applications.

The Segmentation Module add-on to Business Analyst Desktop allows users to understand customers more fully by integrating demographic information with lifestyle segmentation, purchasing, and behavioral data. This detailed portrait of existing customers can be used to improve service to them. More significantly, it can also be used to identify concentrations of households that match the profile of preferred customers. These concentrations present significant opportunities for market expansion.

ESRI Business Analyst Server expands the capability of organizations to integrate business GIS into their enterprise information technology systems. It allows IT and GIS professionals in these organizations to create business GIS workflows using Business Analyst technologies, integrate them into existing enterprise systems, and make them available to users throughout the organization. At this level ESRI Business Analyst is no longer a specialized tool used by a few experts in the organization. Rather, it is woven into the fabric of the enterprise, supporting the spatial awareness that is now an integral part of its analytical and decision-making processes.

This book will follow Living in the Green Lane throughout this process, from its initial business plan to its maturation as an organization with business GIS fully integrated into its enterprise information technology infrastructure. Each chapter will focus on a different stage in that process and on different products and technologies in Business Analyst. However, the central focus will be on the LITGL enterprise and how its business evolution determines its use of business GIS technologies.

The book is sequential in two ways. First, it follows the development of Living in the Green Lane from its inception to maturity as an enterprise. Second, it navigates through ESRI Business Analyst in a progression from the most broadly available Web-based systems (BAO) through desktop tools and extensions to enterprise-wide implementations of Business Analyst tools (BA Server).

That said, Living in the Green Lane illustrates only one of many possible paths to business GIS implementation. Other organizations may take different approaches. Many are not "born spatial enterprises" while others may wish to focus on individual applications rather than the holistic approach presented here. To support these readers, each chapter begins with an Executive Summary, which describes the business issue addressed in the chapter as well as the Business Analyst product and analytical tools employed. The Executive Summary also includes a listing of the cost and benefit factors relevant for the return on investment (ROI) assessment of the business GIS applications used in that chapter.

Taken together, the Executive Summaries can serve as a solution map for executives whose task is to decide which set of capabilities is most relevant for their organizations. In this approach, readers would identify and implement the most cost-effective method. When the implementation proves the ROI case to be solid, the organization then can move on to other applications in its evolution as a spatially aware enterprise.

To facilitate this flexibility in using applications in this book, exercises in each chapter are procedurally independent. That is, though the site-selection process in chapter 4 builds

logically on the environmental analysis of chapter 3, readers can perform all the tasks in chapter 4 without completing those in chapter 3, and so on in subsequent chapters.

A final note: While this book covers a wide range of Business Analyst capabilities, it should be viewed as illustrative rather than exhaustive. Its purpose is not to serve as an operations manual, but to illustrate the role of business GIS in decision making throughout the business life cycle. As a reader, you should view your journey as an introduction to the capabilities of business GIS and Business Analyst rather than an inventory of those capabilities. As you work with these tools in the role of a Business GIS Analyst for Living in the Green Lane, be alert to other options within the software that might serve as more relevant tools for the issues facing your organization.

Preview of chapter content

With these considerations to guide you, here is the path that lies ahead:

Part I: Trade-area analysis and site reporting with Business Analyst Online

Janice and Steven's initial challenge is to secure funding for their new venture. To do so, they must write a business plan for investors that assesses the potential success of the enterprise within its consumer and competitive environments. This plan must reflect an understanding of these environments as well as include a business model for responding to them effectively. For retail enterprises such as Living in the Green Lane, store location is a critical success factor. Investors must be convinced that consumers in the Twin Cities will support the new store and be attracted to its location.

To make this case, Janice and Steven must describe the types of consumers who would be attracted to the store, identify concentrations of those prospective customers in the Twin Cities area, and evaluate alternative store locations from which to serve them. As their GIS planner, you will use thematic mapping, study area creation, and reporting capabilities of Business Analyst Online to perform these functions for LITGL. At the conclusion of this analysis, you will consider the return on investment (ROI) value of this application of BAO.

Chapter 1: Mapping the business environment: population and potential site characteristics

Janice and Steven begin their site-selection process by working with an economic revitalization agency in the Minneapolis-St. Paul area. That organization provides tax incentives for companies that acquire existing empty facilities in the area and use them for commercial purposes. To evaluate the benefits of this approach, you will use Business Analyst Online to define a study area and create thematic maps of its population characteristics. You then will define trade areas around this site using several different approaches, select the most appropriate trade-area model, and generate selected reports on its population characteristics. Finally, you will compare this area to other portions of the region to determine if more attractive sites are available. If that is the case, you will opt *not* to acquire the available revitalization site.

Part II: Business environment analysis with ESRI Business Analyst Desktop

As they continue the process of selecting a site for their first store, Janice and Steven must also consider the business environment in which they will operate and the opportunities for success within it. This is influenced not only by population characteristics of potential site locations, but also the competitive environment. That environment includes the proximity and size of competitors, the proximity and attractiveness of retail centers, and the transportation network that provides customer access to potential store locations. You will use the thematic mapping and map symbology capabilities of Business Analyst Desktop to identify and evaluate these factors. As these considerations are part of the initial site-selection process continued in Part III, the overall ROI analysis of this process is covered there.

Chapter 2: Thematic mapping with Business Analyst wizards and layer properties

Business Analyst Desktop provides automated tools for developing thematic maps and symbolizing various types of data layers. You will use these to map relevant demographic characteristics of the Minneapolis-St. Paul area. You will also use the settings available in Layer Properties to refine the maps you create, the symbology with which you represent data layers, and the classification schemes you use to portray population and business characteristics.

Chapter 3: Advanced thematic mapping and symbology, creating datasets, dynamic ring analysis

In addition to its standard thematic mapping tools, Business Analyst Desktop provides users with significant capabilities for creating new data layers, calculating new attributes, and customizing layer symbolization. These capabilities allow users to tailor their maps and data to the demands of specific research projects. Janice and Steven require that this type of data manipulation includes some characteristics of the green customer profile in their business environment analysis. You will perform these steps to create and map the data layers required to achieve this end. You will also use dynamic ring analysis to identify potentially attractive spots for the company's first store.

Part III: Trade-area analysis and site selection without customer data

Having integrated population data about the Minneapolis-St. Paul Core-Based Statistical Area (CBSA) with information about their competitive environment, Janice and Steven are ready to select a site for their first store. To do so, they will consider several trade-area models from Business Analyst Desktop, use one of them to define trade areas around six available sites, consult reports generated by Business Analyst Desktop to evaluate those sites, and select the most attractive one. At the conclusion of this process, you will consider the ROI impact of Business Analyst Desktop applications in retail site selection.

Chapter 4: Geocoding and evaluating alternative potential sites

A commercial real estate agent provides Janice and Steven with a list of six available retail locations in the Minneapolis-St. Paul area. They assign you to evaluate the attractiveness of these sites. You will begin by geocoding the addresses of the sites and displaying them on a map. You will then use Business Analyst Customer Prospecting and Trade Area Analysis tools to identify concentrations of attractive customers, create threshold rings of potential

sales, and display trade areas of competitors. You will also use Locator Reports to quantify shopping centers and competitors in the vicinity of each available site. This information will inform the final site-selection decision you make in chapter 5.

Chapter 5: Defining trade areas, generating reports, selecting best site

Having analyzed the business environment, identified pockets of attractive customers, and assessed the competitive environment, you are ready to select the best site for the first Living in the Green Lane store. In this process, you will use Business Analyst Desktop to define specific trade areas for the available sites, generate reports on their characteristics, use this information to select the most appropriate site, and create map documents to support your recommendation.

Part IV: Customer profiling and site selection with customer data

Living in the Green Lane is successful in its basic green-building business, but Janice and Steven believe that customers would welcome a more comprehensive approach to green living, one that encompasses wellness values, preference for local organic foods, and participation in recycling and reuse programs. If this is true, Janice and Steven plan to broaden the LITGL concept from that of a "green-home center" to a "green-lifestyle center." They then plan to extend this concept to other parts of the Minneapolis-St. Paul metropolitan area by opening two additional stores to serve a population cluster that matches the profile of the most valuable customers from their first store.

Chapter 6: Building a profile of distinctive customer characteristics

Janice and Steven provide you with a list of Green Living Club members and direct you to create a profile of the best customers in this group and assess their affinity for the longer list of product/service lines they wish to implement in expanding the company's marketing concept. You will use the geocoding and spatial overlay functions of Business Analyst Desktop to attach demographic attributes to each customer record and to assign each customer to a Tapestry Segmentation segment. You then will use the Tapestry Segmentation data to learn more about customer preferences, purchasing patterns, media exposure, and lifestyle values with Market Potential Indexes. Finally, you will use this data to select the specific product/service line additions necessary to appeal to the green consciousness of customers with this profile.

Chapter 7: Customer-based trade-area analysis and site selection

The customer profile and expanded product/service mix you designed in chapter 6 provide the foundation for the site-selection process for Living in the Green Lane's second and third stores. You will use this customer data and the trade-area options of Business Analyst Desktop to define customer-derived trade areas around the existing store. You also will use the Find Similar function to identify areas of the Minneapolis-St. Paul area with concentrations of households that match this profile. In addition, you will use Principal Components Analysis to evaluate the potential of several alternative sites and an Advanced Huff Model to estimate distance decay and sales levels around these sites. These analyses will allow you to select two locations for new Living in the Green Lane stores in the Minneapolis St. Paul CBSA.

Part V: Sales territory management and route optimization

Living in the Green Lane's three stores initiate home services for pest control as well as lawn and garden maintenance services—all using organic products. A sales team of six representatives will sell the services and each store will have a service team to provide them. To manage these new services effectively, you will create a sales territory system that balances sales potential equitably among the three stores and six sales representatives. You will also use Business Analyst Desktop to optimize the routing of daily calls by one of the service teams.

Chapter 8: Sales territory design and balancing; route optimization

Living in the Green Lane's sales territory system requires two levels, with two sales representatives assigned to each of the three stores. You will use the Territory Design extension of Business Analyst Desktop to design an initial structure based on annual lawn and garden expenditures and total population. You then will refine this system by reassigning ZIP Codes between territories to correct geographic imbalance and align territories with existing transportation patterns.

In its initial implementation of its new service systems, LITGL will assign a service team to each store. Each team provides services to households in the store's sales territories. To maximize the efficiency of these operations and minimize drive time, you will use Business Analyst Desktop's routing tool to determine the optimal route for one day's service calls for a team, illustrating the potential savings of this technology when applied across the service routing function.

Part VI: Customer profiling and segmentation with the ESRI Business Analyst Desktop Segmentation Module

All three Living in the Green Lane stores are profitable and the company's green-lifestyle center concept has proven successful. Janice and Steven wish to expand the pace of growth significantly through increased sales to existing markets and expansion to new geographic markets. Their expansion strategy envisions a combination of company-owned stores and franchise agreements with local partners. As the company emphasizes relatively small, local service regions, they plan to enter each new market with at least four stores, of which at least two are company owned.

Both of these growth strategies require greater understanding of Living in the Green Lane's customer base. In the first case, a detailed profile of existing customers, their lifestyles, and their buying habits will help the company refine its marketing strategies to serve them more effectively and reach similar customers in current market areas. In the second case, the profile will serve as a model for evaluating marketing opportunities and projecting revenues in other geographic areas in the United States. You will use the Segmentation Module extension of Business Analyst Desktop to perform these analyses.

Chapter 9: Creating customer profiles

The Segmentation Module provides two approaches for creating customer profiles. The first is the Address Coder system, which is built into the module. Using it you will geocode the addresses of the 1,800-plus members of the Green Living loyalty club—LITGL's best customers.

With Address Coder you will also produce reports summarizing the demographic and lifestyle characteristics of these customers as well as a Business Analyst map layer.

The Segmentation Module also provides profiling capabilities for several population groups. You will create profiles of your customers and the Minneapolis-St. Paul CBSA. This will allow you to compare the characteristics of your best customers to the general population in which they live. What's more, the Segmentation Module allows you to create segments based on consumer survey data. This capability enables you to explore the characteristics of consumers who are, for example, heavy purchasers of organic lawn and garden products. The profiles you create in this chapter will provide the basic data for segmentation analysis in chapter 10.

Chapter 10: Segmentation analysis for enterprise expansion

In its segmentation analysis procedures, the Segmentation Module integrates customer profile data with internal enterprise sales data, Tapestry Segmentation lifestyle information, and Mediamark Research's consumer expenditure data to produce a comprehensive view of a company's customer base. You will use it to identify the most important groups of LITGL customers based on highly concentrated Tapestry Segmentation segments among Green Living members as well as those groups with the highest levels of average annual purchases.

Once these segments and their spending patterns are identified, you will develop LITGL's penetration strategy by exploring their purchasing, lifestyle, and media-exposure patterns and devising responsive marketing strategies. In addition, you will assess the level of LITGL's market penetration in its trade areas and perform gap analysis to identify geographic areas near existing stores with lower than expected customer households. These areas are attractive targets for the penetration strategy.

You will use the Segmentation Module to develop LITGL's expansion strategy as well. Using the Core, Developmental and Niche groups that you define, and the expenditure patterns of these segments, you will project the company's potential sales level in other CBSAs across the United States. You then will focus on an attractive CBSA and use trade-area assessment tools to determine if it will support the necessary four Living in the Green Lane stores required by Janice and Steven. Once appropriate CBSAs are identified, the trade-area and site-selection analyses you performed in Minneapolis-St. Paul would be repeated to ensure success in the new markets as well

Part VII: Expanding enterprise integrated business GIS with ESRI Business Analyst Server

With its national expansion, Living in the Green Lane has completed its growth from a local start-up company to a vibrant, growing national enterprise. Integrated business GIS has been a valuable tool at each stage of that growth process and plays a significant role in the day-to-day management of the company's operations. At this stage, it has grown beyond the scope of a single business GIS Analyst, even one with your advanced capabilities. It is necessary, therefore, to empower managers in each of the company's new markets and stores to utilize integrated business GIS tools in their operations and decision making.

The system that enables this capability is ESRI Business Analyst Server, a server-based business GIS system that allows analysts to aggregate relevant business GIS maps, data, and analyses, then deploy them across the Web for use by other managers or, in some cases, the company's customers. By combining central hosting of data, maps, and tools with substantial processing capacity in browser-based GIS clients, Business Analyst Server transforms the ESRI Business Analyst from a powerful analytical tool for individual analysts to more comprehensive system that supports enterprise decision making with business GIS capabilities at all levels of the enterprise.

Chapter 11: Serving applications with ESRI Business Analyst Server

In this chapter you will follow the process of disseminating integrated business GIS resources across the enterprise from both system administrator and user perspectives. For the administrator perspective, this process has three stages. In the first, enterprise GIS managers author and serve GIS resources to other users across the Web. This involves transforming the maps, analytical tools, and reporting functions from desktop activities to online mapping and processing services. Business Analyst Server builds on the underlying capabilities of ArcGIS Server to accomplish these tasks.

In the second stage, user roles and capabilities are defined for enterprise managers. While this task serves a security function, its primary goal is to match business GIS resources appropriately with the roles, responsibilities, and skills of the managers who will be using them. Thus, this function ensures that managers will be using the maps, data, procedures, and reports most appropriate for their decision-making responsibilities.

Once suitable roles and permissions are established to ensure proper access, the third stage of building role-specific workflows begins. Workflows are systematic streams of tasks structured to produce the analytics and metrics that support specific managerial decisions. Site selection and customer profiling are examples of the types of workflows implemented in Business Analyst Server. Business GIS managers may use the standard workflows provided in Business Analyst Server, customize those workflows, or design their own customized workflows to meet the specialized needs of the enterprise.

You also will work with Business Analyst Server from a user perspective. Specifically, you will assume the role of a new store manager charged with developing a profile of the store's customers to improve merchandising and to design integrated marketing communications to reach attractive new customers.

In this role, you will use the workflow developed in the first part of the chapter to geocode customers, map their location, identify their distinctive characteristics, identify Core and Developmental segments, and understand their purchase and media exposure patterns. These tasks will illustrate how Business Analyst Server tailors its business GIS resources to the needs of individual managers and how workflows can be used to standardize the analytical process and, over time, create a structured professional development path in which managers expand their business GIS skills as their professional responsibilities increase.

Part VIII: Conclusion

As a "born spatial enterprise," Living in the Green Lane has relied upon integrated business GIS for developing its marketing strategies, guiding its growth, and supporting its operations. As the company continues to evolve, so too will its reliance on Business Analyst applications.

Chapter 12: Growth trajectories with integrated business GIS

This chapter discusses the four ways in which this evolution will occur. The first is a more sophisticated use of existing Business Analyst tools. As LITGL's knowledge of its customers, competitors, and opportunities develops, its ability to exploit the advanced modeling and analytical functions of Business Analyst also will grow.

Second, integrated business GIS tools will become even more enmeshed in the company's daily operations. Web-based applications will support company-wide dissemination of effective customer and market analysis tools. Integration of GPS technologies deployed across mobile devices will increase the effectiveness of sales personnel and service technicians alike. Integration of Business Analyst with other enterprise information resources will support more effective exploitation of those resources and the valuable marketing data they contain.

Third, as Business Analyst develops, it will provide increasingly sophisticated tools for business GIS applications. Thus, more elaborate tools for, say, trade-area analysis, territory design, and customer segmentation will increase the value of these applications for Living in the Green Lane.

Finally, as the demands on modern enterprises continue to increase, so too will the ability of integrated business GIS to address them. Undoubtedly business environments are becoming increasingly risky and, in many ways, dangerous. Similarly, increasing concern for the physical environment and global climate change will result in expectations for greater accountability of business performance in these areas. Thus, applications such as Business Continuity Planning and Sustainability Assessment and Reporting will become more important. And, as these are inherently spatial analyses, they will necessarily entail expansion of integrated business GIS tools within enterprises that perform them.

In short, though this book offers a significant introduction to the value of integrated business GIS throughout the development of a business enterprise, its story is not complete. Indeed, it describes only the first steps of a continually evolving adventure with integrated business GIS as a core resource for making key business decisions. The most exciting part of that journey lies ahead.

Notes

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2. Keenan, Peter. 2005. Concepts and theories of GIS in business. In *Geographic information systems in business*, James Pick, ed. Hershey, Pa: Idea Group Publishing.

3. The people and Web site are fictional. Any resemblance to actual organizations and/or individuals is coincidental.

4. Both the person and the organization are fictional. Any resemblance to actual organizations and/or individuals is coincidental.

5. Von Paumgarten, Paul. 2003. The business case for high-performance green buildings: sustainability and its financial impact. *Journal of Facilities Management* 2 (1) June: 26–35.

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